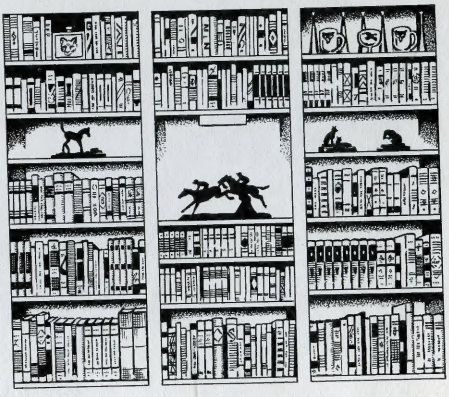

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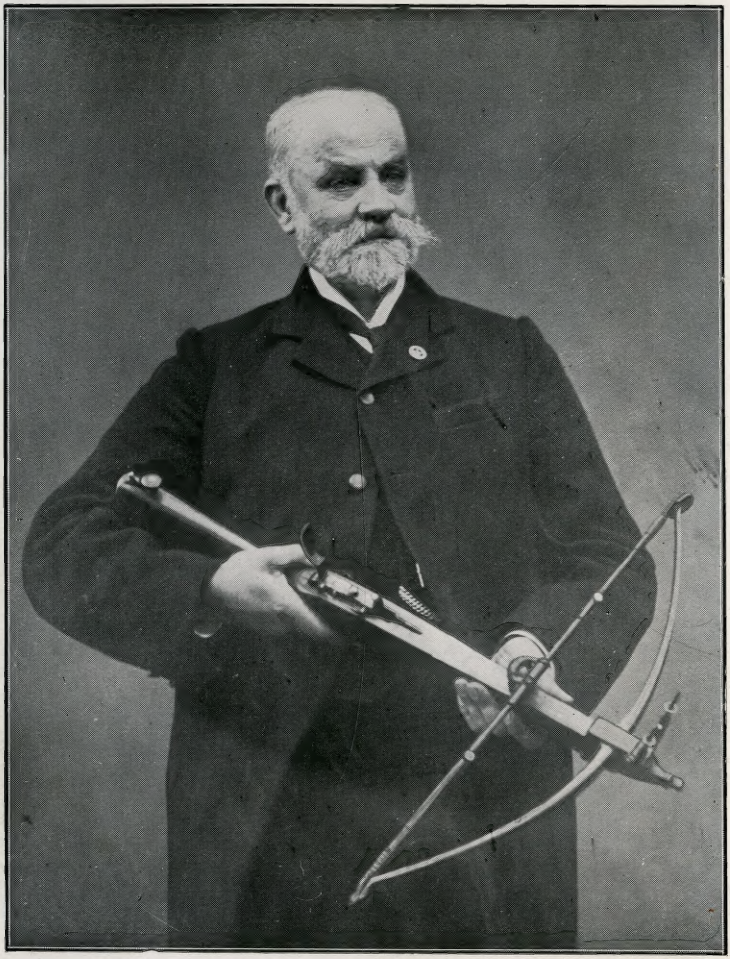


Daniel Higson

The Bullet Crossbow,

With an

Extensive Bibliography on the "Arbalist."

NOTES ON OLD GUNS.
AN ANCIENT WHEEL-LOCK.
QUAINT FRENCH FOWLING.
A HARE POACHING ADVENTURE
MAN TRAPS, SPRING GUNS
AND DOG SPEARS.

By DANIEL HIGSON.
PRESTON.

CHORLEY:
W. J. SANDIFORD,
1923.

MADE AND PRINTED
IN GREAT BRITAIN.

The Bullet Crossbow.

By Daniel Higson, Preston.

ONE of the most interesting old sporting "engines," or weapons, is the Crossbow. Though it never played as important a part in our history as the longbow, it had in one respect a great advantage over that implement—it did not need a long apprenticeship to acquire an expert use of it.

It was the earliest arm of precision. Who invented it is not known. To say that it is a development of the ancient "Ballista" would seem not to be the fact, when it has been used by such widely divergent nations as the Greenlanders, Chinese and some of the African tribes.

On the European Continent it was popular as a weapon in mediæval times.

In the early part of the nineteenth century, the Crossbow still played its part as a sporting implement, being used for rook shooting, and doubtless other similar work.

A very great advantage is its almost silent discharge, which disturbs the birds less than even a small bore rifle or an air gun.

When properly set, it is very accurate at short distances, and a candle can be snuffed at about a dozen paces.

If used for rook shooting, as most of the shots are perpendicular, or almost so, face the bird, and aim at the root of the tail, as the bow has a very high trajectory, and the ball may be dropping over the shooter's shoulder if he aims at the breast as he naturally would. This applies to a rifle also but not to such a great extent, the speed of the missile being so much greater, and the trajectory very much lower.

A rifle shot will understand what is meant.

As the bow is often regulated at about an angle of 45 degrees, say at a chimney pot, it would be best to shoot at this angle, but one cannot always see the birds without getting almost directly under them, and in fact it is natural to get as close as possible.

I don't know if I have made myself clear. Two minutes shewing would be worth pages of writing.

At page 104 of "The Shot Gun and Sporting Rifle," 2nd edition, the late Dr. Walsh fully explains this.

One point about the Crossbow must not be forgotten : it is a **very** dangerous weapon, both to the shooter and the bow, and care should be taken not to let the lever slip whilst " setting."

My old friend John Stephenson, of Bedale, Yorkshire, was setting the first bow I ever had, and the spring in the butt, which holds the lever in position, being broken, he forgot to hook the latch over with his little finger, and snapped the lever down, thinking it would catch. Instantly the lever flew up, or rather the bow sprang to meet the lever, and one branch of the grains, or foresight, which he had omitted to depress, struck him on the face, and the weight of the bow broke one side of the grains, leaving a piece sticking in his nose. When I entered the room he was tugging at the piece of metal to get it out. What would it have done had it been his eye or his forehead ?

The safest way to set the bow (after folding the grains and unhooking and bringing the lever forward) is to place the sharp end of the stock on the ground, and then stooping with the butt end against the chest, grip the string with one hand on each side of the pouch, and pull the loop or cradle over the hook of the tumbler. Next push a bullet in the centre of the pouch, which has contracted with the strain of the partially stretched string. Now press down with the left hand on the heel-plate and the right foot against the front end of the stock (taking care not to damage the bead-string), put the palm of the right hand under the knob of the lever, and press upwards until the lever is seen and heard to catch in its proper place. This is safe even if the latch spring is missing.

You can now elevate the " Grains " and the back or leaf sight. Be careful in aiming that the fingers of the left hand are not above the level of the stock, or the string on discharging will probably " sting " them severely.

Now close the left eye and look through one of the peepholes in the backsight with the other eye, taking the lowest hole for choice, and when you get the bead of the foresight on the centre of the mark, press the trigger. If the bow shoots to the left, push or twist the bead to the left, if to the right, move it in that direction.

Sometimes the bead is on a thread like a screw, and has to be turned round like a nut to move it. In other cases it may be on a single knot, and can be pulled to either side.

If the ball strikes too high, raise the bead-string on the serrated forks of the grains. If too low, either lower the string or sight through one of the higher holes in the leaf.

Fill any hole that is too low with bees wax, or soap will do at a pinch. The higher holes may be left open for elevation if thought proper. Really, I believe, they were made so as to use whichever turned out most convenient, as a deal depends on the shape of the bow and the exact angle it is fixed in the stock.

Some crossbows are without trigger underneath, and are discharged by pressing the button on the top of the lock, with the thumb, taking care not to touch the pouch or cradle. Again, other bows have a straight stock with a knob at the end of the butt. In these the lever is held in place by a movable square ferrule, which drops over the end of it. These never have an under trigger. This is a more ancient pattern of a crossbow, slower in setting, but safer.

When charging the crossbow, be sure to place the bullet in the very centre of the pouch, as the accuracy of the aim depends on this.

A very powerful bow will carry a 28 gauge round bullet, but a 36 or a 40 gauge is more usual. Never discharge a bow without a bullet in the pouch or the bow may be broken.

When the bow requires stringing, it is not a very difficult matter if you have an old string for a pattern. Generally, if there is a string on an old bow, it is either out of order or soon goes when brought into use. Formerly, I always used gut in stringing a bow, but I find that Sir Ralph Payne-Gallwey was correct about string being best, and I now invariably use string as being better and cheaper than gut. Directions for stringing the bow should be followed carefully if you mean to make a neat and well finished string.

For materials, provide a ball of sailmaker's sewing twine or of number 16, three or four ply, flax twine, whichever you like; a ball of whipcord about the thickness of a violin " D " string, and a piece of bees wax. Now get a bit of smooth wood about three inches wide and half an inch thick and exactly the length of the distance across the bow at the notches, the wood to be nicely rounded at the ends. Another way, is to bore holes and drive two round pegs, half an inch in diameter, into a strong piece of wood, spaced as above. This is the better method.

Proceed to make a hank by taking 40 turns of the string, finishing by a reef knot. Before taking the hank off the board or pegs, divide the strands in half, and tie a bit of coloured yarn round each half. This will enable you to get the crosstrees or stretchers in the middle of the hank. Be sure to wind any kind of soft twine all round the hank about half an inch between the turns. This will stop the hank from falling loose.

Now you may take it off the forming board, and put it on the lath or bow. This if you have the proper appliances, is not as difficult as it seems.

Perhaps the simplest way is to bore a couple of holes near the end of a bench or long plank, at least two inches thick, the holes to be the width of the bow stock apart. Then drive in each hole a bolt about half an inch thick and place the bow between them. Attach a strong rope to each extremity of the bow, either by iron hooks or rings, but not within the notches. Take a strong iron bar or a good piece of wood, about two inches in diameter, and putting it in the loop of the

rope, using it as a lever against the end of the bench, bend the bow while an assistant slips the hank into its place.

Another way is to fix a piece of thick, soft iron wire to the bow by twisting or wedging it from slipping. You may then have it quite short and bend the bow by its own lever.

By fastening a hand vice to each extremity of the bow, and fixing the wire on the outside of each, there is no fear of any giving way.

Another way is to get a pair of clamps, each with two bolts and wing nuts, and screw these on the bow, not quite to the notches. Make a bastard string by forming a short hank of 15 turns of three or four ply flax sewing twine, with a loop or eye worked at each end with whipcord, and wrapped about three or four inches with whipcord in the centre of the string. Get a couple of large oval iron rings and "S" hooks and fix the bastard string beyond the clamps. By having a few spare "S" links, the string can be lengthened at will.

The clamps do not need any eyes on them, as shown by Sir Ralph Payne-Gallwey and myself, you get more leverage by hooking direct on to the bow.

This is the system I always follow now for any bow with a lever, but some of the old bolt bows being without lever, the long rope, bench and bar have to be used.

Get a strong bar for the purpose of bending the bow ; I once bent an old musket barrel utterly out of shape by using it as a lever.

To proceed with the string making, begin wrapping with the whipcord well waxed, about two inches from the centre, and continue for four inches. To fasten, place a loop of string on the wrapping and wind over it say eight turns, then pass the end of the whipcord through the loop, which pull up tight, and thus draw the cord under the last eight turns, make a single knot, and cut off close.

Do this at both the top and bottom of the hank.

Leave this part for the present and proceed to fix the stretchers, two of which are required.

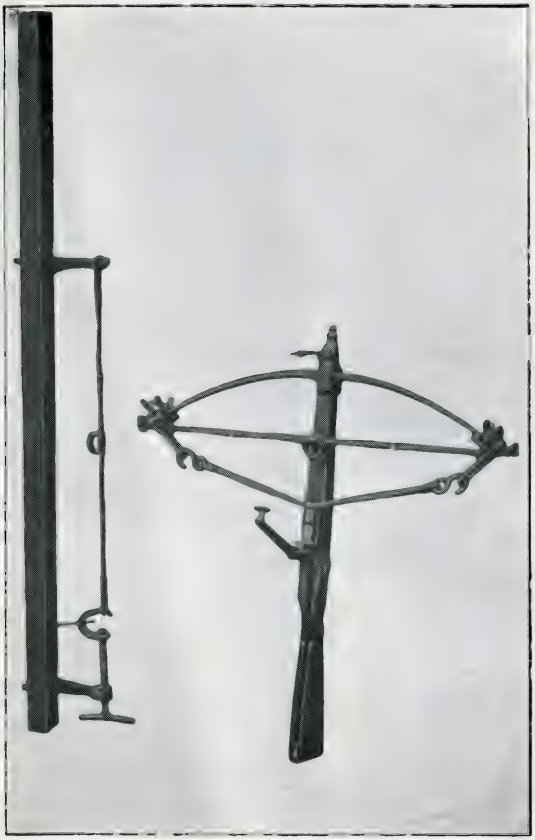
Below is a good shape shewn full size.

They are made of ivory, brass or copper, about one and five-eights of an inch long, including a recess at each end, quarter of an inch long. These are placed one on each side about six inches from the centre of the bow string. They can be turned in the lathe or filed from brass or copper wire. Ivory is best because of being lighter.

Let the top and bottom strands of the hank be divided equally, the bits of coloured yarn will allow you to do this exactly. Slip the stretchers in and wrap fast to the string, beginning one and a half inch from the place they are to be fixed, and continuing for one and a half inch past, fastening the ends of the whipcord as before.

It is of great assistance to have a couple of wood wedges hollowed at the ends and about one and a half inches long to keep the top and bottom of the string asunder, whilst wrapping the stretchers in position.

Having fixed these stretchers, take off the bow string by the same means that you got it on, and commencing on the top side, say four inches from one end; wrap singly with whipcord for one and a quarter inches, then take in the bottom of bow string for one and a quarter inches, and then proceed singly to form the eye, making a knot outside all round, "tatting" both for strength and ornament. When the eye (about one and a half inches long) is finished, you can crochet a ring round the eye. Now go over the part where top and bottom are joined together, making a knot at each turn. Finish off singly one and a quarter inches on the lower limb of the string. After you have made the other eye, put the string on the bow, but before doing so place a leather washer over each notch of the bow. The string will be rather more difficult to get back, as the various wrappings, the stretchers, eyes and leather



Crossbow shewing how Clamps and bastard string are fixed and Stringing Machine with finished string attached.

[Photo by Mr. S. Crook, Preston.

washers, will have shortened it somewhat. Should the string be rather tight, omit the leathers, or make them very thin.

Now go back to the centre of the string and take a piece of soft leather, the thickness of a strong boot top (I have used a piece of soldier's buff belt, which answers very well), and cut it three quarters of an inch wide and quite three inches long. With shoemakers' waxed thread stitch this round the top and bottom of the hank, where the ends of the leather overlap the hank being towards you. Next take a piece of smooth wood not less than one inch in diameter and say three inches long, and wind some of the same kind of string as the hank round the wood former and the top of the bow string, so making a loop of 30 turns. Do the same with the bottom of the bow string. Wind soft thread round each of these loops to keep them separate, then withdraw the wood former by gently twisting it round and pulling it upwards. Wrap round the loops with whipcord for a permanency, beginning on the bow string, right hand side, half an inch from the loop. When you have wrapped about three quarters of an inch of the top loop, take in the bottom loop as well for another three quarters of an inch, and then go on single and finish off half an inch on the left hand of the bow string.

Next begin at left bottom of string half an inch from loop, three-quarter inch single, three-quarter inch double, three-quarter inch single, finishing off half an inch on right of bottom string. Thus you have a four-cornered sling or cradle at the back of the leather loop, and doubly armed with whipcord in the centre.

In going over the centre the second time, make a slip knot with each turn, " tatting," as this enables you to pull the string tighter, and is also ornamental.

The string is now finished.

Let me repeat : always keep the grains down till you want to shoot, and drop them as soon as you have made the discharge.

Never keep a bow bent for a long time, rather shoot the ball to waste. If expecting a shot, hook the pouch

to the tumbler with the ball in place, and the lever ready for bending the bow. In this position it will do no harm to discharge by pressing the knob of the lock, as the bow being only slightly bent, does not receive undue strain even if there is no bullet inside the pouch.

Should the spring inside the lock be broken, to make a new one does not take long. Take a suitable piece of clock spring, which heat to a cherry red, cut to width and bend to a " V " shape, then temper it by fixing a piece of wire to the spring, again heat and plunge into sperm oil or tallow, then hold in the fire till it blazes all over, and wave in the air till the blaze goes out, then again dip in the oil.

Put the open part of the spring towards the butt or it may break, and jam the lock. The bow can be worked without the spring, but the pouch is very liable to slip off the lever in setting.

Should the bow miss discharging when the trigger is pressed, see if the lock has worn grooves in its bed, thus causing a ridge which prevents the scear from working ; if so remove the ridge with a narrow paring chisel and all will be well.

It generally takes five or six hours to make a string.

If your bow has no string at all, try to see one before attempting to make one yourself.

I now use an instrument something like a joiner's cramp for framing the hank on. It is a bar of wood 4 feet long, $2\frac{1}{4}$ in. broad, and $1\frac{1}{4}$ in. deep, with a ⊢ shaped screw, which has a loose hook end working in a bolted eye, at one end of the board, and at the other end a bolted hook, which can be fixed in one of six holes 3 in. apart so as to get the correct length of hank.

This is most convenient and saves taking on and off the bow. It is an improvement of a similar instrument in the possession of Mr. Hillier, of Hereford, and also of one formerly used by Messrs. James Burrow, Ltd., Gunmakers of Preston. This latter, however, has an iron bar in place of the wooden board.

Now that we have got our bow in working order, may I gossip a bit more about the history of it.

Locally, the laths were forged by a smith of the name of Bamford, on Friargate Brow, Preston, and Mr. James Burrow, Senr., the founder of the firm, was in the habit of tempering them himself. In this process I believe a tallow candle was used. The late Stephen Troughton told me he well remembered going for the forgings, when a lad, and then watching the "old master" do the tempering.

He also used to talk of the skill of the old man, in shooting with the bow, and often told of having seen him pick off in consecutive shots twelve bullets placed on a wall, at full range. The second James Burrow was also skilful with the bow, and for many years shot at Greenbank House, Tulketh Hall, and Frenchwood, Preston.

An old trade card which I have before me, shews two sportsmen with a dog and guns, just leaving a boat to beat some swampy ground, and bears the legend: "J. Burrow, Gun, Pistol, and Crossbow maker, 116 Fishergate, Preston. Gunpowder, Patent Shot, &c." Evidently issued before the percussion system was in vogue, as there is no mention of caps. I have seen a small oilpainting of the above picture. The price of a crossbow about the year 1850 was seven guineas.

Another trade card has an illustration of a sportsman shooting at a pheasant, whilst his horse is standing by. A very crude drawing. The lettering is: "T. Stensby, Gun, Pistol, and Crossbow Maker, Withy Grove, Manchester." Formerly this establishment was in Hanging Ditch, and a long barrelled flint-lock duck gun stood in the doorway, and reached through a hole in the ceiling. Many a pilgrimage did I make to look at that gun, when a lad.

I have also ten picture post-cards entitled: "Collection Real Armeria," VI., Serie 2. There are several wheel-lock guns and pistols, &c., also four crossbows. The series are published by Hauser & Menet, Madrid, and were kindly brought from Spain by a young friend of mine.

Two of the bows shewn belonged to the Emperor Charles V., one of which has the Cranequin fixed for

bending the bow. The other two were presented to Philip III., by James I., of England. These latter have the goat's foot lever in position for bending. It was carried separately and not permanently fixed to the stock, as in the modern style.

A couple of bolts are alongside each bow, all the bows being elaborately finished.

Specimens of the crossbow may be seen in the Preston Museum, in the Blackpool Museum, and in that of Mr. H. P. Hornby, at St. Michaels-on-Wyre. I have several, one of which is by Foster, of Preston.
Mr. D. W. Allsup, Fishergate, has one by Caton, Preston
Mr. J. H. Burrow, ,, ,, ,, Burrow, Preston
Mr. G. Catterall, Lea, ,, ,, Bolton, Wigan
Mr. H. H. Edmondson, ,, ,, Bolton, Wigan
Fishergate,
Mr. J. Leigh, Lea, ,, ,, Rt. Fell, Lancaster
Mr. J. Miller, Woodplumpton, has a Chinese Crossbow.

The Warrington Museum possesses a bow by Barker, of Warrington.

One of the bows in Preston Museum is a modern Swiss bow, such as is used by the military schools of Switzerland at the present time for the purpose of teaching shooting. These bows are bent by means of a detachable wooden lever.

At the present day the Swiss Halfpenny stamp exhibits a Crossbow with Tell's son holding an apple impaled upon an arrow or bolt, so that it would appear that the tale of Tell shooting the apple from his son's head is more than a tradition in Switzerland.

Of course we all know that William Rufus was shot by a crossbow bolt.

According to "Hansard" one of the wheels of the cart which conveyed the body of Rufus to Winchester, was in existance about a century ago. We also remember that Richard the Lion Heart was fatally wounded by a crossbow.

"Hansard's" Archery, which was published in 1840, is by no means a scarce book, and is well illustrated. It contains a most interesting chapter on the crossbow.

Crossbow by Bolton, Wigan, the property of
Mr. H. H. Edmondson.

Singularly enough it is not mentioned in Sir Ralph Payne Gallwey's monumental work "The Crossbow," although, next to his book, it contains more information than any other work referring to the subject.

It is to be hoped that sometime there may be another edition of Sir Ralph's book. It might be printed on a much smaller and lighter paper, so as to be both cheaper and more portable.

Mr. W. I. Hillier, of The Cottage, Kings Caple, Hereford, has two or three crossbows and scores of antique guns and pistols.

Mr. Alfred Taylor, of Ixworth Abbey Estate Yard, Bury St. Edmunds, has about 16 crossbows, many of them being for bolts, i.e. :—with a groove and single string, with a separate goat's foot lever.

Mr. H. Furmage, of Chelsea, also has a fair number of both kinds of bows, many of which I have strung for him. One is by Green, of Prescot, with club butt.

Most bullet bows have the lath fixed in by iron wedges. These bows were formerly called "Prods."

The two bows made by Bolton, of Wigan, before referred to, have a hinge and screw, an expensive but good plan. The lath can be taken out without unstringing.

Some bows have a spiked bolt and nut, but these are mostly for bolts. It is a very simple and easy way of securing the lath.

The Swiss Bollinger bow is fastened by a plate and four screws working two bars. The lath can be detatched without disturbing the string. These crossbows can be had now, fitted with a hair-trigger.

Many of the bows now made and used on the Continent, are very elaborate.

Sir Ralph Payne Gallwey shews a Belgian crossbow with a slotted barrel, which discharges a bullet weighing 3/9 in silver coin. I find this to be a number 22's gauge, so it must be a very powerful bow. It is bent by a detached iron lever, a modification of the old goat's foot. Although he kindly sent me the address of the person who supplied him, I was not able to get

any reply. In fact, Sir Ralph said: "that, good customer as he had himself been, he had not had any answer to his last letter."

I have written to various sources on the continent, but with little success. I append translation of the last reply I had:

"LIEGE (BELGIQUE),
28 and 30 RUE GRANDGAGUAGE,
"SIR, 25th March, 1921.

"I have read in the "Journal des Chasseurs," "of February—March, that you ask for information "concerning arbaletes (crossbows) with barrel.

"I make modern arms, but am an amateur of "ancient arms, of which I make equally the business. "I am a member of the Administrative Commission "of the Leige Museum of Arms.

"Some years ago I bought an ancient crossbow "with a barrel, very heavy, and with this a bag of "balls, but instead of being in lead were in red-lead. "I sold this arm to M. F. Bannerman, of 501 Broadway, "New York, who, as you perhaps know, makes a great "business of collecting arms.

"I still possess a barrel crossbow, but much "lighter.

"Though neither of these arms have any mark of "origin, I think they are of Belgian make.

"We have here in the country a good many "Societies for shooting with the crossbow, but "especially in the Flemish country. Here, near "Liege, at Vise, a town you may know by name for it "was the first town burnt by the Germans in August, "1914; they have a very ancient Society who have, "for some ten or twelve years, required me to make "the crossbows for the young members, and I have "made some fifty. I have also sold to Mr. Bannerman, "already named above, and which he figures in his "catalogue.

"I have at present a dozen ancient crossbows and "one pistol. If you have occasion to pass near Liege, "it will give me pleasure to show you my arms, but I "have no catalogue.

"I am always at your service, if I can give you "information upon ancient arms.

"Receive, Sir, my very sincere salutations,

L. ANCION-MARX."

It is evident that barrel crossbows are not now made in Belgium.

The two barrel bows in Bannerman's catalogue do not resemble the one depicted in Sir Ralph Payne Gallwey's Book.

Before his death, the author sold the bulk of his collection to Messrs. Greenwood, of York, but he must have thought well of his barrel bow, as it does not appear to be in those advertised in the "Connoisseur."

I have tried several slotted barrels using laths specially imported from Switzerland, but have never succeeded in making one shoot accurately, they all shot wild, probably caused by the steel lath not being powerful enough. They might have been all right with a nice fitting baked clay bullet.

A "pump" air gun which is quite accurate while the air is well condensed, invariably sends the bullet anywhere when it is getting exhausted.

There are several windlass crossbows in the Tower collection. They are the most powerful of any, and the most clumsy, also very likely the slowest to be bent, as it would take time to adjust the cords of the windlass. These were probably the kind used at Crecy, for some copies of Froissart's Chronicle (as in mine), have crude illustrations of such in the act of being bent.

With regard to the kind of strings used at that battle it is said that the rain rendered the Genoese Bows useless, or nearly so. This would imply that gut was the material used, as the wet would so relax the strings, that the bows would have little force. Had they been of vegetable fibre, they would have been tightened, thus causing the bolts to be thrown farther, and with a lower trajectory, improving the shooting if anything.

However, the modern Swiss bows strung with twine, are sent out with instructions not to be used in wind or rain. A small pamphlet with diagrams is

issued by the makers, but unfortunately it is written in German. There does not appear to be an edition of it in French.

This pamphlet has been very kindly translated for me by Mr. J. H. Burrow. Its chief interest consists in shewing how very thoroughly every little detail is noted.

The "Manufacture Francaise d'armes et cycles," make two kinds of crossbows: one with a slotted barrel shoots a harpoon attached by a line to a reel, and is used for the purpose of killing fish. The propulsive power is by two indiarubber cords, hooked on to a straight metal bar. The other one has a steel lath, but no barrel and a grooved stock for bolts. The price for this before the war was 45 Francs.

The "Flechettes" are 26cm. long, with steel points and horn ends with feathers, price 1 f. 75 c. each.

The surname Fletcher means Arrowmaker. Bannister, which is a corruption of Balluster, may mean either a crossbow maker or user.

The following paragraph will be found interesting.

"Speaking at a meeting of the Royal Geographical "Society, Mr. George Forrest gave an interesting "account of the journey undertaken by the late Mr. "Litton on the Upper Salwin, 1905, with an object "both political and geographical. 'The Lissoo vil- "lages are nearly all at war with one another,' he said: "'suspicion sits enthroned among those limestone "ridges. If I had to suggest a title for a book on the "Upper Salwin,' said the speaker, 'I would call it "the "Land of the Crossbow," which is the character- "istic weapon of the country and the Lissoo tribe. "Every Lissoo with any pretentions to chic, possesses "at least two of these weapons—one for everyday use "in hunting, the other for war. The little children "play with minature crossbows. The men never leave "their huts for any purpose whatever, without their "crossbows; when they go to sleep, the "nuskung" "is hung over their heads, and when they die it is hung "over their graves.'"

Mr. Friedenthal, who is a native of Bohemia, tells me that when he was a lad, crossbows were used for shooting at figures (conventional birds) on the top of a pole with bolts that had a hole in the head, which made a whistling noise in their flight. The shooter knocking down the most birds, won the prize.

An officer just returned from France, says a similar custom attains there at the present day, but in this case empty bottles are used as marks.

As a boy, I had what was called a "Tobacco-pipe Gun," being a crossbow which discharged broken pieces of pipe stems. Rather crude in comparison with the present day spring air-guns.

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In addition to the works already quoted.

Shakespeare was well acquainted with the crossbow, and incidentally there may be a near approach to truth in the deer stealing story of his youthful days.

"3RD PART, KING HENRY VI., ACT III., SCENE I."

"A chase in the north of England.

Enter two keepers, with crossbows in their hands.

1ST KEEPER.—'Under this thick-grown brake we'll shroud ourselves:

For through this laund anon the deer will come;

And in this covert will we make our stand.

Culling the principal of all the deer.'

2ND KEEPER.—'I'll stay above the hill so both may shoot.'

1ST KEEPER.—'That cannot be, the noise of thy crossbow

Will scare the herd, and so my shot is lost.

Here stand we both, and aim we at the best,

And, for the time shall not seem tedious,

I'll tell thee what befel me on a day

In this self place where now we mean to stand.'"

In "Twelfth Night," Act II., Scene V., Sir Toby says:

"Oh for a stone bow to hit him in the eye."

The stone bow, or pellet bow, was the early form of bullet bow. They were usually not very powerful,

and could be bent by hand without using any lever. The missile was probably something like a marble—or of baked clay—as a bow of this kind with so weak a lath, would not throw a heavy leaden bullet with much speed or force. The stock of these bows was generally bent or rather hollowed out, so as to allow the string to clear it, and the lath was fixed with horns canted up a little.

It is rather singular that many of the illustrations of crossbows in "fancy" pictures should be of this shape, when they are supposed to shoot bolts, and ought to be shewn with straight stocks.

There was not, however, always a groove for the bolt, as sometimes the butt of it would rest between the wings of the lock-wheel, and the point on a "U" shaped bit of ivory, so that there would be scarcely any friction.

On page 36 of "The Crossbow" is a picture taken from "Famous Women," by G. Boccaccio, 1st edition, 1473, entitled "Mounted Crossbowman," this should evidently be "Crossbow-woman," as the figure is that of a woman wearing a long dress and a turban. She has just slain a woman who lies on the ground, with a bolt in her throat, and is now aiming at either one or the other of a couple of lovers standing together.

In the "Master of Game," written or rather translated about 1406, from the French of Count Gaston Phœbus, by Edward III.'s grandson, Edward, second Duke of York (who perished at Agincourt), but only printed this century, at page 220 will be found a plate entitled "Shooting Hares with Blunt Bolts." One of the sportsmen has a long bow and the other a crossbow, and the hares are so accommodating as to sit less than a couple of yards away. Verily they must have been tame in those days. Of course their descendants have had a few centuries experience of their forebears instilled into them.

One notices this apparent tameness in nearly all the old sporting pictures. It would appear that a great deal would have to be left to the imagination of the student.

The last edition of "The Master of Game," the oldest English book on hunting, edited by Mr. and Mrs. Baillie-Grohman, with a foreword by Theodore Roosevelt, was published in 1909, at 7/6, by Messrs. Chatto and Windus.

"Country Contentments," by Gervase Markham, at page 46, 8th Edition, 1656, it is stated with a marginal note, of "Shooting in Crossbows."

"If infirmity in the arme, or back, take from a "man the use of a longbow, he may then with a cross-"bow made for gafel carried upon a string, and the "neather end placed on a rest, with arrows made "strong, heavy and sutable to the strength of the bow, "Shoot at all the former marks, and reap the same "pleasure he formerly did with his long-bow."

"Criminal Trials," vol. 2.—"The Gunpowder Plot," Charles Knight, 1835, p.86, states :—"In cross-"ing the court Thomas Winter was shot through the "arm by a cross-bow arrow, and disabled," and again, p.271 :—"At which conference there were various "devices how to kill Her Majesty (Queen Elizabeth), "some spake of a little crossbow of steel, that should "carry a little arrow level, a great way : and if the "same did with a small arrow draw blood, she should "not escape it."

Harrison Ainsworth in the novel "Guy Fawkes," refers to the first incident.

"The Matebele Campaign," by Major General R. S. S. Baden-Powell, 1900, has, on page 122, an illustration of two Boer boys shooting with a crossbow. The text says :—"The young idea was also learning "to shoot by crossbow, and it was interesting to see "what good positions they got into for firing in the "quickest manner, using aim and trigger just as with "a gun. A crossbow should be an excellent instrument "for teaching the elements of rifle shooting."

"A treatise on Archery, or the art of shooting with the Longbow, likewise a Dissentation on the steel Crossbow, with directions for using it," Sixth Edition, by Thomas Wareing, 1827, two plates, one shewing a crossbow, see page 51 to 56.

Boutell's "Arms and Armour" contains a few illustrations of crossbows with a slight description.

Daniel's "Rural Sports," 3 Vols., "Shooting," p.315—316, has a couple of paragraphs of sound information on the crossbow, 1801.

"British Field Sports," by Wm. Hy. Scott (John Lawrence), 1818.

Blaine's "Encyclopædia of Rural Sports," new edition, 1852, 600 illustrations, shews two pictures of crossbows. See page 146, modern bullet crossbow, with about 21 lines quoted from Daniel; and page 931 for anecdote from Hone's "Every Day Book."

Strutt's "Sports and Pastimes of the People of England," 1845, contains interesting reading, with an illustration or two of crossbows.

"A Century of Guns, a sketch of the leading types of Sporting and Military Small Arms, with over 150 illustrations of guns and rifles. 'Unto the Guyle of All Artillery, Crossbows, Hand-guns and of Archery,' from Stow's Survey of London, 1633." By H. J. Blanch, p. 26, correcting an error, says: "The use of "the term 'hammer' is a little confusing, when writ- "ing or reading about old guns, as in the Flint lock, the "part standing up and joined to the pan cover was "called the hammer, and the falling part which carried "the flint, was called the 'cock.' When the flint-lock "disappeared, the name hammer was transferred to "the falling piece, or cock. The hammer in the flint- "lock was sometimes called the 'hen,' then we have "the 'cock' and the 'hen.' The trigger used to be "called the 'tricker,' and survives from crossbow days; "it was the thing that did the 'trick.'"

"Shooting, its appliances, practice and purpose," by Jas. Dalziel Dougall, Sampson Low, 1875, page 4, says:—"The sling, increasing the power of the muscles "of the arm, was probably the first extrinsic appliance, "followed by the long bow and arrow, and these again "by the more complicated crossbows, catapults and "other engines of war and the chase."

"The Sportman's Directory and Park and Game-keeper's Companion," by John Mayer, Gamekeeper,

7th Edition, 1845, Simpkin Marshall & Co., pages 96 and 97 :—" Let two or three go with lanterns and " candles lighted, extended in one of their hands ; and " in the other hand a small net like a racket, but less, " fixed at the end of a long pole, to beat down the birds " as they sit at roost ; which, surprised with the great " blazing light, will not stir until they are knocked down " A crossbow for this kind of sport, is very useful to " shoot them as they sit." And again, page 173 : " By " an Act of 10th July, 1817, the crossbow is prohibited " ' inter alia ' in night poaching."

" The Genuine Poetical Works of Charles Cotton, Esq.," 1765 ; " Burlesque upon Burlesque or the Scoffer Scoffed," Promotheus says, page 171 :—" A " Theban should deliver me, One of thy old acquain- " tance, and A proper Fellow of his hand, Who with " a lusty Bolt and Tiller, Will come and be my Vul- " ture's Killer."

" Instructions to Young Sportsmen in all that relates to Guns and Shooting," by Lieut. Col. Peter Hawker (died 1853), 9th Edition published 1844, page 574 :—" 33 Henry VIII. Cap. 6, Prohibited the use of crossbows and handguns, unless by persons having £100 a year, etc.

" The Modern Shooter," by Capt. Lucy, 1842, page 302 : " Crossbows and airguns have this advantage, " they never set fire to rick yards."

" The Field Book of Sports and Pastimes of the British Islands," by W. H. Maxwell, 1833, illustrated, on page 63 quotes from Daniel.

" Hone's Every Day Book," 1848, vol. I., page 494—5, says :—" Some years ago there were several " large elm trees in the college garden, behind the " Ecclesiastical Court, Doctor's Commons, in which " a number of rooks had taken up their abode, forming " in appearance a sort of convocation of aerial ecclesias- " tics. A young gentleman who lodged in an attic, and " was their close neighbour, frequently amused himself " with thinning this covey of black game by means of " a crossbow. On the opposite side lived a curious old " civilian, who observing from his study window, that

" the rooks often dropped senseless from their perch, " or, as it may be said, without using a figure, ' hopped " the twig,' making no sign, nor any sign being made " to his vision, to account for the phenomenon, sets " his wits to work to consider the cause. It was " probably during a profitless time of peace, and the " doctor having plenty of time, weighed the matter " over and over, till he was at length fully satisfied " that he had made a great ornithological discovery, " that its promulgation would give wings to his fame, " and that he was fated by means of these rooks to say : " ' Volito vivus per ora virum.' His goosequill and " foolscap were quickly in requisition, and he actually " wrote a treatise stating circumstantially what he " himself had seen, and in conclusion, giving it as the " settled conviction of his mind, that rooks were subject " to the falling sickness."

" The Shooter's Guide or Complete Sportman's Companion," by B. Thomas, 7th Edition 1823, with five plates, page 304, giving details of an Act for the Prevention of Persons going round by night, armed for the destruction of game, of 57th Geo. III. Cap. 90, mentions :—" Gun, Crossbow, Firearms, Bludgeon or " any other offensive weapon." In the list of gun-makers, occur the names :—" Lancashire, Lancaster, " Eadon, J., gun and crossbow maker ; N. Wales, " Wrexham, Cowper, J., crossbow maker." Also the names of T. Styan, Market Street, Manchester, (founder of the firm of Stensby & Co.) and J. Burrow, then of " Friars Gate," Preston. References to dog spears and spring guns will also be found in this book.

" Engraved Illustrations of Antient Arms and Armour," from the collection of L. Meyrick, Esquire, 2 vols., folio, 1830. Contains several illustrations of old crossbows and much interesting reading on the subject.

" Weapons of War," being a History of Arms and Armour, by Auguste Demmin, with nearly 200 illustrations, translated by C. C. Black ; Bell and Daldy, 1870. A great deal of interesting reading, pages 73 to 84.

Unfortunately the illustrations are very crude.

"Shooting," by Robert Blakey, with four illustrations, published by Routledge, about 1850, contains the anecdote of shooting rooks at Doctor's Commons from Hone.

"British Rural Sports," by "Stonehenge," J. H. Walsh, 7th Edition, 1867, page 586 :—"Crossbows are "bows set in a frame, they are, however, now seldom "used, except for rook shooting, and even there the "pea-rifle has almost entirely superseded them." There is a Norman crossbow illustrated.

"History of the Anglo Saxons," by Thomas Miller, 2nd edition, 1850, pages 319, 331 and 332.

"The Gentleman's Recreation," in four parts, viz. :—Hunting, Hawking, Fowling and Fishing, by Nicholas Cox, 6th Edition, 1721. At page 82–3–4 of Manwood's Forest Laws (Black Letter), says :—"Of Bows and Guns and shooting at Game" :—

"1.—No one shall shoot with or keep in his house any Crofs-bow, Hand-gun, Hagbut (Harkebut or Harquebut) or Demihake, unless his lands be of the value of £100 per annum on pain to forfeit £10 for every such offence. Anno 33 H 8. Cap. 6.

2.—None shall shoot with or have any Hand-gun under the length of one yard, nor Hagbut, or Demihake under the length of three quarters of a yard, on pain to forfeit £10. And it shall be lawful for any man having lands of £100 per annum, to seize any such Gun or any Crofs-bow, used or kept contrary to the form of this Statute, but then he ought to break them within 20 days after, on pain of 40s. Idem Statut.

NOTE.—The word Hand-gun includes a Dag, though invented since the Statute, and the word Crofs-bow, includes a Stone-bow, and a Hagbut is a Hand-gun, three quarters of a yard long.

3.—None shall travel with a Crofs-bow bent, or Gun charged (except in time of war), or shoot within a quarter of a mile of a borough, City or Market Town (except for the Defence of himself and his house, or at a dead mark), on pain of £10.—Idem Statut.

4.—None shall command his servant to Shoot any Gun or Crofs-bow (except at a Dead Mark, or in time of war), on pain of £10.—Idem Statut.

14.—A Servant, upon Command may use his Master's Crofs-bow or Gun (not prohibited by this act) so he shoot at no Fowl, Deer or other Game, and may also by a License in writing, carry it to any place to be mended.—Idem Statut.

15.—None under the Degree of a Baron shall Shoot with any Hand-gun, within a City or Town, or Shoot at any Fowl whatsoever with any Hail-shot, on pain of ten pound and three Month's Imprisonment..—Idem Statut."

"Notes on Game and Game Shooting," by J.J. Manley, M.A., illustrated, "Bazaar" Office, 1880, page 383.

"It was all very well to take a pot shot at a rookery "in the olden days, when the best weapon to be had "was a crossbow, or with a 'bolt bow,' or bow and "arrow, with which weapons Blaine tells us that "rookeries used formerly to be 'assailed.'"

"Jesse's Gleanings in Natural History," 11th Edition, 1869, repeats the Doctor's Commons rook shooting from Hone.

"Waterton's Essays on Natural History," states that the author was appointed Crossbow Charger, &c., at Stonyhurst College, probably in the opening years of last century.

"The Gun and its Development," with notes on shooting," by W. W. Greener, illustrated, 1881, pages 8, 9 and 10, with two illustrations of Crossbows and Quarrels.

"A History of Fowling," by the Rev. H. A. Macpherson, M.A., Edinburgh, David Douglas, 1897. See page 26 for an engraving of crossbow, &c., fowling at night (same picture shewn in Sir Ralph Payne-Galwey's "The Crossbow"), and also tailpiece.

"The Amateur Poacher," by Richard Jefferies, pages 273, 4 and 5. Some of the most beautiful of this delightful author's writing:—"But were I offered "participation in the bloodiest battue ever arranged,

" or the freedom of an English forest or mountain track,
" to go forth at any time untrammelled by attendant,
" but only to shoot with matchlock, wheel-lock or
" crossbow, my choice would be unhesitating."

" Archery," by C. J. Longman and Col. H. Walrond, &c., 1894, Badminton Library, with numerous illustrations. See pages 26, 27, 85, 115 and 116.

" Seafowl Shooting Sketches," by D. Higson, 2nd Edition, 1909, pages 87 to 90.

" Etterlyn (Petermann) Kronica von der loblichen Eydtgnoschaft Ir har komen sustseltzam stritten und geschichten, Basel, Furter, 1507." On C.4. is another remarkable and artistic cut of William Tell shooting the apple from his son's head, this is the first book containing the account of William Tell, and the cut is the earliest representation of the incident.

Page 2498, Catalogue of early printed and other interesting books, manuscripts, &c., part XIII., Cal.—Chr. With reproduction of the above picture showing a crossbow having a straight stock or " tiller." J. & J. Leighton, 40 Brewer Street, Golden Square, London.

" The Diary of John Evelyn." Speaking of his visit to Geneva, in 1646, the writer says :—" A little
" out of the towne is a spacious field, which they call
" Campus Martius . . . for here on every Sunday,
" after the evening devotions, this precise people permit
" their youths to exercise armes, and shoot in gunns
" and in long and crosse-bowes, in which they are
" exceedingly expert, reputed to be as dextrous as any
" people in the world.

" To encourage this, they yearly elect him who
" has won most prizes at the mark to be their king of
" the long-bow, gun or crosse-bow. He then wears
" that weapon in his hat in gold, with a crown over it,
" made fast to the hat like a broach. In this field is
" a long house wherein their armes and furniture are
" kept in severall places very neately."

" Chandos Classics " edition, pp. 192 and 193.

I have a specimen of the crossbow hat badge, but in brass.

Blome's " Gentleman's Recreations," 2nd edition, 1710, page 32. The laws of the Forest and Game says : " If they find any man out of the King's Highway " carrying of either Crofs-bow, Long-bow or Gun, or " any other Engine, to hurt or destroy any Wild Beast " of the Forest ; they shall take them with the same, " and bring them to the Verderers."

" A Physician's Holiday, or a month in Switzerland in the summer of 1848," by John Forbes, M.D., F.R.S., 2nd edition, 1850, page 119, states :—" Close " before our inn, in the market-place, there is a venerable old tower of common and even rude architecture, " which is said to have been built anterior to the date " of Swiss freedom. Its exterior walls are ornamented " with rude frescoes representing the one grand subject " of all the pictorial legends of Uri, the tyranny of " Gesler and his fellows, and the terrible vengance of " Tell. Close beside this tower there is a public fountain, understood to mark the spot where Tell's son " was placed.

" . . . . that sweet boy
" Whose head the ruddy apple tops, while he
" Expectant stands beneath the linden tree—

" and further down the street there is another, considered to be the spot where, the matchless bowman " stood in his agony. I measured the distance between " the two fountains, and found it to be about 120 " paces ; a distance, I apprehend, quite within the " range of a cross-bow."

There are also further interesting remarks bearing on the same subject, on the two following pages of Dr. Forbes' book.

" Soldiers and Sailors, or Anecdotes, Details and Recollections of Naval and Military Life," with 50 cuts from designs by John Gilbert, with picture of Cross-bowman shooting.—London, 1842, p. 83.

" Time and Clocks," by H. H. Cunynghame ; Constable, 1906, pages 183—187.

Roby's " Traditions of Lancashire," 5th edition, 1872, vol. I., Clitheroe Castle, page 430.

"Life and Times of Sir Ralph Sadlier," by Major F. Sadlier Stoney ; Longmans, 1877 :—" Mary Stuart " . . . was again able to handle a crossbow for " killing a deer." Page 227.

" A History of the British Nation," by A. D. Innes, illustrated by T. C. and E. C. Jack, 1912, page 158, &c., woodcut of a windlas crossbow.

" Archæologia," or Miscellaneous Tracts relating to Antiquities, published by the Society of Antiquities, London, vol. 53, 1893. The crossbow of Ulrich V., Count of Wurtemburg, 1460, with remarks on its construction by the Baron de Cosson, F.S.A., pages 445 to 464.

" Preston's Progress Through its Guild," by A. J. Berry, M.A., 1922, page 27.

" Schuss und Waffe,"Neudamm, 1st March, 1908, contains several good illustrations of ancient crossbows.

" A West Country Pilgrimage," by Eden Phillpotts. Referring to Berry Pomeroy, he states :— " For it was a stronghold impregnable before the days " of gunpowder.

" So the banner with the Pomeroy lion upon it was " set aloft on the bluff, and soon the sleep of the woods " departed to the strenuous labour of a thousand men. " There is a great gap in the hill close at hand that shows " whence came these time-worn stones, when a feudal " multitude of workers were set upon the task. Then, " grim, squat, and stern, with a hundred eyes from " which the cross-bow's bolts might leap, arose another " Norman Castle, its watch-towers and great ramparts " wedged into the woods and beetling over the valley " beneath."

"Inventory and survey of the Tower of London," by Charles Foulkes, in 2 volumes, with 42 full page plates and 624 other illustrations. H.M. Stationery Office, 1915. The latter part of 2nd volume pictures many crossbows and early firearms.

" The Ancient Mariner " :—" With my crossbow I shot the Albatross," is of course well known.

Patterson's " Man and Nature on Tidal Waters,"

Goethe's " Egmont."

Schiller's " Wilhelm Tell."
Lamartine's " Guillaume Tell."
Kingsley's " Hereward the Wake."
Scott's " Ivanhoe."
Scott's " Legend of Montrose."
Scott's " Count Robert of Paris."
Ainsworth's " Lancashire Witches."
Ainsworth's " Guy Fawkes."
Ainsworth's " Windsor Castle."
" Robin Hood," by Pierce Egan.
" Wat Tyler," by Pierce Egan.
" The Sailor Crusoe " by Percy B. St. John.
" The Adventures of Philip Quarll."

All the above contain references to the crossbow.

" Heath's Book of Beauty," 1835 or 1836, in " A Tale of the 17th Century," by the Hon. G. C. Grantley F. Berkeley, speaks of the crossbow being used for deer stalking.

Three types of Flint Lock Blunderbuss.

The early history of firearms and missile weapons is very obscure. No doubt the first projectiles would be stones thrown by hand, then would follow the sling, bow and arrow, crossbow, and finally the gun.

Along with these would develop the more cumberous machines, such as the catapult, ballista and cannon.

The first gun would appear to have been a kind of portable cannon, generally worked by two men. It was simply an iron tube affixed to a rude stock, and ignited by a lighted match (fuse) applied by hand to the touch hole.

Probably the smoke and noise would be almost as effective as the bullet or slug in dispersing the enemy.

An early improvement would be a movable cover to the touch hole, so that the priming would not be lost, and also to some extent be protected from the weather.

The next development was the serpentine match holder, which was most likely the cock and trigger combined, in one piece of metal.

Then the mainspring would follow, which kept the lock at full cock (except when the trigger was pulled), so as to prevent the lighted match coming in contact with the priming. It was necessary to blow the match to get it glowing just before pulling the trigger. The word pulling is used advisedly, as it would have to be a pull to overcome the resistance of the spring.

I have possessed two Hindoo and one Japanese matchlocks which, however, had to be cocked as in an ordinary gun. They were not very safe, as the least touch was sufficient to loose the trigger. One of the Hindoo guns was once accidentally discharged by blowing the fuse while the priming was exposed. No damage was done, the gun being pointed up.

One of the Hindoo guns spoken about was similar to one in the Tower Armoury, but much smaller, as it only weighed about seven pounds. The barrel was four feet two inches long, and appeared to have been bored out of the solid, or perhaps forged as a tube with solid breach end. There was a kind of extinguisher on the lockplate, which would be safer and cleaner than using the fingers when putting out the match.

The match or fuse was made by steeping a thick piece of string in a solution of nitre and water, and then drying it. The correct proportion or strength of the mixture can be easily ascertained by experiment. I have found cotton string, or rope, best for the purpose, though doubtless it would be some form of hemp that would be used in the early days in this country.

The three blunderbusses shown in a group were formerly in my possession. They are typical.

No.1, is a brass barrelled piece, with iron ramrod, which has an extracting worm worked on the end. It is a well finished weapon, but no name on the lock. It bears the word " Manchester " on the barrel. The furniture is of course brass. The spring bayonet is in perfect order, period about 1840.

No. 2, also has brass barrel and furniture, and similar iron ramrod. It is a much older gun, probably well over a century, and is not so well finished as No. 1. The name on it is Columbell, London. This weapon has probably been a coachman's, being sheathed in a long wicker basket. A folding bayonet would make it awkward to withdraw from its cover. Of course the ramrods of both guns may not be original. I once called up and shot a corncrake with this weapon.

No. 3, brass barrel and furniture, but a wood ramrod, doubtless original, fitted in pipes on the left side of the barrel, this is necessary as the bayonet folds underneath, and the catch to release it can be seen in front of the guard. It is a very well finished gun, and in excellent condition, walnut stock. The name upon it is Nicholson, No. 25 Cornhill, London.

All these blunderbusses may have been used for either house or coach protection.

It was supposed that the bell muzzle assisted the charge, presumably of slugs, to spread.

One almost thinks it would have been dangerous to risk a shot at an armed burgular or highwayman with these implements, as in case of a missfire, the robber would not have shown any mercy. It is an old tale, that the best plan was to stab first and shoot afterwards, when the assiliant was safely impaled. However, flint guns were not so apt to missfire as one now supposes.

In the first place, the steel facing of the hammer, or pan cover, had not been worn away or lost its temper, also flints, being in ordinary use, were easily renewed, and thus presented a sharp edge to the hammer face. Flints were still to be obtained at some of the old gun shops, at the price of three a penny, between 1860 and

1870. My mother has told me that she recollected when a girl—about 1830—her father sending her for a penny-worth of flints to strike a light with, and the price was about the same. Ten flints to 100 charges were allowed in the army. They are still made for export in this country, and named: "musket," "carbine," or "pistol," according to size, &c.

In my younger days, many guns converted from flint to percussion were in use, but now they seem to have almost disappeared. The price for conversion was generally 5/–, I paid that sum for converting the first blunderbuss I ever had, and since then I have been guilty of such an act of vandalism myself.

Anyone attempting to use a flint gun must remember to hold on after pressing the trigger, as there is a slight but perceptible interval between that operation and the gun "going off."

It is difficult to imagine how such a quick flying bird as a snipe could be killed on the wing with a flint gun, and yet it seems to have been nothing extraordinary.

Mr. Daniel, writing in the early part of the last century mentions a fenman who could perform the feat with a gun having a six foot barrel.

I have on one occasion only, with a long barrelled oriental flint pistol, dropped a gull on the wing.

A "Brown Bess" flint musket of mine is exactly similar to the muskets used at the battle of Waterloo.

The weight without bayonet is nine pounds.

Bore about No. 10. Length of barrel three feet two and a half inches.

The length overall, stock and bayonet, six feet.

Bears the Tower "broad arrow," crown and G.R. on the lock. It is both a clumsy and inferior weapon, but when it did hit, made a big hole. No wonder with a bore of thirteen sixteenths of an inch.

Col. Hanger says: "A soldier **must be very unfortunate indeed** who shall be wounded by **a common musket** at 150 yards, **provided His Antagonist Aims At Him.**"

Highly decorated Wheel-lock belonging to Mr. Edmondson.

Wheel-lock of an ancient gun. It is beautifully engraved, and is a specimen of craftsmanship which could not be surpassed at the present day. It has lately come into the possession of Mr. Edmondson, the well-known local collector of antiquities.

The wheellock is a rare type of the earliest form of self-igniting gunlock. The first guns were simply hand cannons, in which the charge was fired by hand; next a serpentine holding a piece of lighted slow match was brought down on the open pan by pressure of the finger on the trigger. It is interesting to note that it was often spelled tricker, as noted before, i.e., the thing that did the trick, and most probably taken from the cross-bow trigger. In fact, the earliest form of a cross-bow lock had both wheel and trigger.

The lock under consideration is a most beautiful piece of workmanship, both as regards "filing" and engraving. It is probably of Saxon or German manufacture, as the earliest locks were made at Nuremburg. There was a pan cover which was probably worked by the serpentine that holds the flint or a piece of iron pyrites. This pan cover is missing in the present sample. The inner part of the lock contains a serrated and grooved hard steel wheel which is recessed into the lockplate; to it is attached a very strong mainspring by means of a small swivel, a small hole in the side of the wheel receives a stud on the end of a long scear, which scear is kept pressing on the wheel by a spring in turn acted upon by the trigger. To discharge the gun a spanner (often kept in a trap in the gun stock) was applied to the square end of the wheelshaft which projects through the outside of the lockplate. This spanner was then turned to the right till the scear engaged in the wheel. Next the priming was placed in the pan, and the serpentine containing the pyrites brought down on the open pan, which it partly closes so as to retain the priming. Then on the trigger being pulled a side pressure on the scear released the wheel, which rapidly turning on the edge of the flint struck fire and ignited the charge—not always, of course.

Wheel-locks were often elaborately engraved with military or other subjects. The present one is a beautiful specimen of the engraver's art, the subjects being taken from the Apocrypha. On the serpentine is depicted Judith with the head of Holofernes in her right hand, and a sword in the left. She is seated under the canopy of a tent. The lockplate illustrated the story of Susanna and the Elders. The human figures are natural and lifelike, the trees are rather formal as if some of them were clipped. The terrace wall and pillars are well shown, and there is a city, Babylon, in the distance. The perspective is good and correct. Mr. Greener, who is a practical gunmaker, suggests that the engraving on wheel-locks was not done by the gunmakers themselves, but by special artists.

Nearly sixty years ago I bought my first sporting book, "Shooting," by Robert Blakey, and, although in a measure copied from Blane's "Rural Sports," it is not a bad book. It contains an account of the French system of decoying birds to the gun by means of revolving mirrors, copied from the 2nd volume of "Hone's Every Day Book." The singularity of the process was so striking that over twenty years ago I experimented with a home made "twirler," which answered farily well, as three larks were dropped in about an hour. Having obtained a couple of genuine French mirrors, I have proved that such attraction undoubtedly exists. For instance, on one occasion three larks circled round the mechanical implement, which all authorities say is not the best, for upwards of five minutes. Now and then they would rest on the ground a few moments, gazing at the astonishing machine, and then resume flying and hovering over it, making the "saint esprit," as the French say. Domestic pigeons, starlings, swallows, and martins have flown round it, but seldom stayed more than a few moments. With the hand-mirror I have kept the string going with the left hand, using the right one to support and fire the gun. So the shots are pretty easy ones. Previously an effort to shoot while pulling the string and holding the gun in the usual manner resulted in a miss.

L'Oisleur, on "Secrets Anciens et Modernes de la Chasse aux Oiseaux au Moyen des Pieges," speaks of another kind of mirror called the English one, and says this is the worst of all. However, it is a fact that some kind of mirror was used in our own country to attract birds to the clap-nets. Osbaldiston's "British Sportsman" (1792) shows such a mirror, with description. There are several other references to lark mirrors. Mitchell's "Birds of Lancashire" has an account of them. It would seem that the French sportsman has a boy to pull the "ficelle." The movement of the machine by the string is much more brisk and lively than the mechanical apparatus. Hence the greater attraction of the first-named.

A bright sunshiny morning in autumn is the best time, and the sportsman arranges so as to have his back to the sun. At the same time he whistles with a call, when birds are in sight. Such a call can be made from the brass bases of two cartridge cases after burning out the paper and punching out the anvil chamber, when the two bases can be with a little humouring knocked together with a hammer.

An interesting article on "Twirling for Larks," by Wilf. Pocklington, appeared in the SHOOTING TIMES many years ago, and is before me in my scrap-book at the present moment. "Facts and Useful Hints on Shooting and Fishing" ("Field" office) also mentions the lark-twirler.

One of the earliest French modern books is "Le Traite Complet de la Chasse des Alouettes au Miroir avec le Fusil," by the Commandant Garnier, 1866. This was followed by "Le Chasseur d'Alouettes au Miroir et au Fusil," by Neree Quepat (no date). Both these works are out of print. "L'Alouette sa Legende Les Mœurs sa Chasse," by Robert Villatte des Prugnes, 1909, "La Chasse á l'Alouette," par André Simon, 1913, and "La Chasse Pratique de l'Alouette au Mirior, au Sifflet et au Fusil," by Leon Raymond, can yet be obtained. I possess all five but the last one is far the most entertaining work, and gives the best idea of the sport. I therefore give a translation of some of the best parts :—

This engine seems to have a respectable antiquity. The Commandant Garnier tells us that the Marquis of Boulogne, great uncle of the charming and regretted writer, the Marquis of Foudras, himself used the mirror in 1792.

Mons. Quepat has read in "L'Ornithologie de Manduit" (Paris, 1784) the description of a mirror nearly like the one most generally used in our day. Our fathers then did not disdain this charming pastime, which I recommend to the attention of shooters, and which has had more than a century of existence. . .

I reject absolutely the employment of all mechanical engines more or less perfect working alone. The

best is no good. One turns only one way; this is the worst; the other has a come-and-go movement which does not resemble the strong working of the classic "string" mirror These various models, winding by means of a key, are as slow as the tortoise of the fable, are stopped by a little strong wind, and have but a blind attraction to the birds. I, myself, have used them to save having an "aid," and I have had little satisfaction from them. One day perhaps a perfect mechanism will be found, but this machine is not yet invented, and, while waiting for this white blackbird—rara avis—we will use the one under our hand and leave to the shopkeepers the "turnspits" which they so obstinately offer us as instruments without defects.

The actual mirror is composed of three pieces—a head of hard wood, a piece in brass, and a foot to be enforced into the ground. The head of the mirror is made with or without glasses; I prefer the former system. The head in its various forms more or less has the appearance of a bird with outstretched wings. Under this head is a square hole which receives the dowel of brass squared to fit at the top and pierced at the bottom with two holes, by which is passed the string to give movement to the apparatus. The foot of the engine shod with iron at the lower extremity, which is forced in the earth, is terminated at the top by a stem of round iron, which plays freely in the brass dowel of which we have spoken.

This model is found at all the ironmongers', and I have used it for a long time, not having discovered anything better. It has yet a great defect—it makes too much noise. The iron stem playing in the brass dowel produces a sound little to the taste of the lark, which detests the rattle.

Floods of ink have been used to explain the attraction exercised by the mirror upon the lark and certain other birds.

Each has said his word, formulated his opinion, and deduced his reasons; yet the problem is still unsolved. The great Buffon contends that the larks see in the flashes from the mirror the light flashing from the sparkling waters.

M. Quepat rails agreeably at this. . . .

I will not pursue further the idea of passing in review all the opinions upon the cause of the attraction which precipitates the lark upon the mirror to the point of making her forget all instinct of self-preservation. This attraction exists, and we profit by it. . . .

I, myself, also during a long time believed I had found the explanation of this phenomenon, but after further experience and profound reflection I have finished by thinking as the sage Socrates : " What I know is that I know nothing."

It is especially when the lark flies at a height of 40 or 50 yards that she throws herself on the mirror. Nothing is more graceful than this fall—the bird, stretching out her feet, closes her wings and falls as a stone from the sky, at some hands' breadths of the mirror, opening the wings, hovering as if charmed above the glasses, offering the image of the "saint esprit" which ornaments the pictures of the old masters. The noise, the movement, a shot, nothing can upset this ecstacy which endures several minutes. She is then very easy to shoot, and, with a little practice, one misses very rarely.

When the passage is abundant and the larks are animated with this goodwill to pitch upon the mirror, one should have a wheelbarrow full of cartridges—one can shoot all the morning, having trouble to load the gun, the barrels scorching the fingers. One finishes by being deaf ; the eyes are dazed, and, although seated quietly on a mound of turf or on a folding seat, the perspiration courses down the face as if taking violent exercise. The slain scattered on the ground, the feathers flying on all sides—this is a scene full of pleasure and animation which would cheer up an Englishman attacked by the spleen.

Without doubt, sunshine is preferable to a dull day; but by the aid of the " call " one can kill numbers of birds without the least rays of the sun. . . .

Most shooters decline to use a dog for this sport for fear of giving it bad habits. . . .

My little Toby, who lacks any pretentions to breed, is, however, a precious auxiliary. . . .

During the months of October and November, on Sundays in the environs of Paris is offered a joyous spectacle. All the shooters, little shopkeepers, of the great city embark by the first morning trains for the country to make a war to the death upon the larks. There is a mirror in each game-bag. They are installed one after the other, and the first bird which adventures in the middle of this redoubtable army is saluted by a fearful fire enough to kill a rhinoceros.

Twenty shooters dispute a lame chaffinch, and a wounded lark is pursued by a band of finished shooters, each of whom claims the honour of the shot which has dropped the little creature. Indefatigable hounds, composed of bassets, poodles, terriers, etc., run at each shot, pulling at the fragments of some audacious sparrow which has tried to clear the line of mirrors. The green forests resound with the whistles of all sizes and calibres playing airs and variations to the frightened birds.

At noon the plains are silent; the massacre has taken place, and, fork in hand, with new objects in view, the shooters new laurels gather. The tales signalising remarkable shots of the morning fly from mouth to mouth, the fortunate ones boasting, and the unsuccessful drowning their sorrows in the pot.

And in the evening, counting the cost, shake their heads.

Ah! it is a grand day for the shooters—Sunday in in the environs of Paris.

Those who have not brought their mirror profit by the neighbourhood of the man better advised, who is furnished with this indispensable engine, and this without asking permission.

Last year I myself was installed one Sunday in October in a corner of a plain that I affected very particularly. There was a good passage coming from the east, and the cloud of larks flew round me. Jealous of taking part in my success, a shooter grotesquely accoutred approached at a deliberate pace to within some yards of me, made a little amicable nod, and stopped with a double shot a pretty band of larks coming right to my mirror. None fell.

"Devil take 'em," said the man; "I shot well." And he approached a bit nearer.

Another band. Pan! a lark tumbled over.

"Eh?" said the shooter, "she is prettily stopped, that one."

The boy (who pulled the string) turned up his nose at me. A veritable cloud of larks flew over my head. My improvised guest fired as one enraged, embellishing his shots with energetic interjections and taking me to witness his cleverness or his mishaps.

"What tumbling over, my boys!"

"Ah! zut! Ah! zut! Another one missed!"

"They are blind, then, these comical beggars!"

"Did you see that double shot, old man?"

"Charming! this is charming! I am delighted! I AM delighted!"

I was enraged. I would not stand it any longer.

"Say, then, sir, you fool of the world, do you believe that I am here to draw the larks under the barrels of your gun?"

"Are you, then, annoyed?" said the shooter, with a tranquil air. "There is no need for offence; I will go."

And he went off, mildly astonished at my outburst, to search for a mirror less well defended than mine.

I once made an extraordinary machine with an old magic lantern, of which I had tripled the large glasses and adapted a petroleum lamp of great power. My friends and nephews followed me with an eye attentive to the construction of this chef d'œuvre which would make pale with jealousy all the lighthouses of the coast from Dunkirk to Bayonne. . . .

The machine was carried to the fields with respectful admiration; each of us with beating heart stepped back to judge the effect. It was terrible. Never lamp fumed, never a night lamp shone more pitifully, than our poor lantern. A little red light invisible at some paces trembled in the glasses of the mirror. It was disgraceful and provoking. A good kick knocked it upside down and sent flying the inert instrument of which

French Lark Mirrors, Hand and Mechanical. From "Shooting Times."

the debris is to-day the admiration of the barn rats, and it was decided in sub-committee that it was a bit difficult to find a substitute for sunlight.

Swallows, linnets, wagtails, and pigeons in a less degree than the lark obey the attraction of the mirror. In the month of October, when one plants his mirror in the fields, the swallows which have not yet gone whirl about the mirror and around the shooter, so that the eye feels great fatigue, and it is best to stop the mirror to get rid of embarrassing birds. Frequently domestic pigeons and the small birds of the fields come down within some paces of the mirror and contemplate with eyes sparkling the wonderful and charming spectacle.

One day, when installed near a long ditch full of water, a kingfisher, impelled by an evil curiosity, came and was killed upon the turning engine. I believe it would be difficult to find a similar case, and none of my friends, enthusiastic lark-shooters, have shot this bird upon the mirror.

There are others than the birds come to the mirror —the fools. For one splendid morning I was after the larks in the plain which extends between Argenteuil, Gennevilliers, and Epinay-sur-Seine. The passage had been good. The sun had risen on a little fog, but had dissipated the vapour and shone in pure and pale blue sky. The larks pitched freely upon the mirror, and, suspended above the glasses with balanced wings, made the movement so dear to the shooter and so favourable to the shot.

A stoppage very appreciable manifested itself all at once in the passage, as up to that time I had lost shots while recharging. The allurement to the birds had moderated, and the flocks parted to the right and left, not appearing to notice the rays of the mirror which sparkled like fire. I turned mechanically, and all was explained. Behind me at some paces a gigantic charcoal- burner, black as Erebus, eyes sparkling with admiration, jerked his arms above his head as if he would dislocate them, and slapped his thighs. He was faithfully copied in all his disorderly movements by a coun-

terpart—his son, without doubt—who exulted with joy. At the movement that I made the two black faces wrinkled in formidable laughter.

"Oh! the pretty invention," said the father. "The foolish game comes to be killed. It is their fate."

"The pretty invention," repeated his son, as an echo.

And the two executed a step dance, thumped each other half a dozen times, laughing like fools, and then, calmly seating themselves, decided to enjoy a spectacle so rejoicing.

"If they rest tranquil," thought I, "it won't be half-bad." Ah, well, yes! Some larks decided at last to come to the mirror. Before I could shoulder the gun, a tempest of laughter, of clacks, of cries, resounded behind my back. The larks filed off without stopping.

"Oh, the pretty invention," said the father.

"Oh, the pretty invention," echoed the son.

It was no use staying. I made a sign to my assistant, who stopped the mirror and wound up the string.

The louts were concerned to see us going.

"Is it already finished?" asked they.

I murmured a vague explanation, while the father and son, already consoled, sloped off, administering blows without number, enchanted that they had assisted at a chasse au miroir. . . .

I remember an incident which occured on the plain of which I have spoken, in a narrow lane between two houses. Two hundred metres at least separated these habitations one from the other. I stationed myself in the middle, and the fusillade commenced. I was well engaged in my sport when I was hailed by a strong and furious voice behind me:

"Sir! sir! it is infamous! it is abominable! You are shooting us! It rains shot on the house! Ah, if the police were here!"

I posed by gun on hearing these maledictions, and advanced to meet a dame red with anger and arms extended towards the sky, taking heaven to witness my attempts.

I arrived hat in hand, but had not time to open my mouth.

"Did you ever see?" cried the dame, yet more loudly. "Conceive it now! My little girl, in the garden, has nearly been killed, and I myself have received an entire charge in my bonnet."

And my amiable interlocutrice pushed into my face a black enough hand, in the palm of which two grains of No. 10 shot proved the attempt she attested with such effrontery.

"My God! madam," said I, all confused, "you exaggerate. The shot you have received could not cause any accident; it falls without any force from the height of the atmosphere, and I have not shot a single time in the direction of your habitation. "Besides——"

"All this signifies nothing, sir! I do not comprehend your explanations, not I. One of my friends has been blinded by a shooter because two grains of shot met in the air and balled!"

What excuse can be imagined for a meeting of two malicious pellets? What would one say as to the frightful consequences caused by this ball formed by these two enraged pellets?

I burst into a laugh in the face of the exasperated dame, and I took up my mirror and went away, pursued by the cries of the virago, where the word fool crossed agreeably with the epithet of idiot.

The most exciting incident I ever took part in, was on Wednesday afternoon, the 13th January, 1875.

At that time I was cashier for the Milking Green Spinning Co., Ltd., at Lees, near Oldham. The mill being situated on a branch of the river Medlock. Being then only in my 26th year, I was able to both run and jump a bit, and was a fair shot.

It would be about 2 o'clock, and whilst standing near a belt of plantation surrounding Birch House (at that time in charge of a caretaker, George Care), waiting for the chance of a shot at fieldfares, that a hare came out of the plantation, running down the meadow in front. Without thinking I raised the gun and shot the hare. Then for the first time I heard the cry of the hounds, and realised what a dangerous predicament I was in. The first thought was to throw the gun in the plantation and run, but it had my name and address on the rib, and if found would betray the owner. Instead, I grabbed the hare, stuck it under my overcoat, and ran down the valley at breakneck speed (and it is steep there), and over the brook. All now depended on the door at the other side being open, fortunately it was so, and I got through and into the boiler house. The hare's legs trailed in the dust, having to stoop while going over the boilers. Being just after two o'clock, there was no one saw me, as all were settled at work, so that I got into my office safely. After depositing the hare in a cupboard under the wash hand-bowl, I got on my stool, panting for breath, my heart in my mouth, and the perspiration pouring down my face.

Presently, the late Mr Thomas Bazley Hall, the secretary of the company, came down the road, through the lodge and into the office. He said : " you ought to have been with me and had your gun just now, you would have had a chance at a hare, it ran past me." " Look at my face," said I, turning towards him. " Have you got it ? " Mr Hall said. " Yes ! " By G——, I'm afraid they'll do you." " So am I," was the reply. " Let me have a look at it," said he. " It's a fine 'un, seven or eight pounds," was his comment.

I never heard Mr Hall swear before. He was a personal friend of Ashton Harrison, the Master of the Ashton-under-Lyne Hunt, and was also a magistrate, but above all, he was a perfect gentleman, and safe not to say anything. A few minutes after, the redcoats came trotting up to the watch house, and pulled up there. "Now for it," thought I, "poor beggar." The watchman, Evan Lewis, went out to speak to them, pulling his forelock (he was an old sailor). After a few minutes conversation, the hunters slowly trotted off and up Rhodes Hill brow, much to my relief.

Old Lewis now came to his door and shook his fist at me. I beckoned, and he came across to the office. His first words were: "Where is it lad." "I'll show you, but first tell me what they said." "Well! they asked me if the cashier was in, and I said yes, you can see him in his office." "How long has he been in?" "About half an hour." "How did he come?" "Through the gate, of course, there is no other way." Now there was no getting over this, as it was not above a quarter of an hour since the hare had been killed.

Had they got a closer view of me, they would have known well enough who had killed the hare.

Previously, it appeared, they had interviewed George Care. "Have you seen a man about with a gun?" "Yes Sir!" "Could you tell who he was?" "No Sir!" "Could you see if he had spectacles on, because I believe that b——r would shoot anything?" said an Ashton-under-Lyne medical man. "No Sir! the trees prevented me seeing clearly." "Well! here's a couple of shillings for you, gardener, keep a lookout and let us know if you learn anything." "All right, thank you Sir."

The following Saturday I asked Canon Whittaker to "Christen" our youngest child, and that gentleman, with his accustomed urbanity, complied, and we had a very jolly party at which jugged hare was the "piéce de résistance," finishing up with dancing, strong waters and tobacco.

The game-keeper, James Kenyon, swore he would catch me, but he never did.

Some years ago, Kenyon's son and his wife's brother, i.e. :—the son's uncle, were both shot, and their bodies concealed on the moors. A man named Buckley was accused of the murder, but was not convicted. A few years ago, Buckley committed suicide. Kenyon is still alive, and about seven years ago, after attending my old friend Renshaw's funeral at Droylsden (we had arranged over 40 years before, for the survivor to see the other put away), I was walking to Lees, and I called at the Hartshead Inn, on Lees new road, for a glass of beer. I enquired: "Doesn't old Kenyon, the ex-keeper live somewhere about here?" "Just across th' road, up th' lone," was the reply. "Well, tell him that the man that shot the hare while the hounds were after her, about 40 years ago, has been asking after him." "Here, come an' sup wi' us, lad." "No thank you, I haven't time."

I may say that I had no intention of spoiling the hunter's sport, I simply couldn't help firing.

At that time my "Sobriquet" was "Gun Daniel."

Having kept a diary for well over 50 years, I am able to give the dates relating to this adventure.

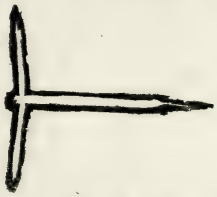
Rook Shooting, with Crossbow at
Ribbleton Hall Farm, Preston, 22nd May, 1919.
[Photo by Mr. Edmondson.—From 'Country Life."

These barbarous implements flourished during the 17th and 18th centuries and earlier years of the 19th. They have now become rare. The man trap was a very large double spring gin. The double spring was so that if a person was caught by one leg only he could not release himself by pressing his free foot on the other spring.

The spring gun was designed for the wires to pull in front of the muzzle, which, however, could be elevated or depressed by a winged thumb-screw if any qualms of conscience touched the setter of it. There was a sliding cover to keep the rain off.

Mr. Edmondson and myself each have an old flint lock specimen in perfect order. Mine is by Higham, Warrington, but the woodwork was so decayed that I had to re-stock it. It seems, from a decision given on the 22nd January, 1820, that it was legal to set these engines if public notice was given to that effect.

I have only seen one specimen of a dog spear, owned by Mr. Edmondson, and from which I had a replica made, and one for Mr. H. P. Hornby, of St. Michael's-on-Wyre.



It is " T " shaped, the top bar (17″ long) sharp at each end (like a double edged sword), whilst the pointed, perpendicular shank (23″ long) was thrust into the ground near a path and covered with loose herbage. These spears must have been intensely dangerous to any living thing tall enough to run against them.

In an action, at Oxford, in 1814, the plaintiff got a verdict for £15, the supposed value of a dog killed by a dog spear set in a wood. See " Shooter's Guide," by B. Thomas, 1823, for interesting particulars of both cases.

Completed by Daniel Higson, 13th August, A.D. 1922,

"In hope of the Peace of God which passeth all understanding. Amen."

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